AMENDMENTS TO THE CLAIMS

Please amend claim 1 as set forth in the following listing of claims, which replaces all prior versions of the claims.

Listing of Claims

1. (currently amended) A directly modulated, distributed feedback gain-coupled laser having an output beam responsive to the application of an input biasing current, comprising an active region to which a grating is applied such that gain-coupling defined by Im(kL) is at least 0.06 ~~wherein the output response is overdamped without reducing the relaxation oscillation frequency of the laser output, so as to quickly respond to a change in the input biasing current~~.

2. (original) A laser according to claim 1 in which the overdamped response is obtained by strongly gain-coupling the laser.

3. (original) A laser according to claim 2 in which the gain coupling is sufficient to provide, in the environment in which the laser is to operate, a significant reduction in the received power penalty from a laser having less gain coupling.

4. (original) A laser according to claim 2, in which the level of gain coupling exceeds a threshold level, whereby, in the environment in which the laser is to operate, there is a significant reduction in received power penalty from a laser with gain-coupling less than the threshold level, but no significant further reduction in received power penalty will be obtained from a laser with gain-coupling greater than the threshold level.

5. (original) A laser according to claim 2 in which, in the environment in which the laser is to operate, the level of gain coupling is sufficient to provide a 3dB reduction in the received power penalty from a laser having no gain coupling.

6. (original) A laser according to claim 1 in which the input biasing current is modulated at a frequency which approaches the relaxation oscillation frequency of the laser output.

7. (original) A laser according to claim 2 in which the environment is uncooled.

8. (withdrawn) A method of creating a laser comprising the steps of:

(a) growing a semiconductor substrate;

(b) depositing a first doped semiconductor layer upon the substrate;

(c) creating an active semiconductor region over the first doped layer;

(d) depositing a second doped semiconductor layer having a charge opposite to that of the first doped layer upon the active region;

(e) defining an index grating which extends along the length of the semiconductor layers;

(f) selectively etching away the second doped layer and at least a portion of the active region in accordance with the layout of the index grating to a depth sufficient to produce a gain coupling sufficient to overdamp the output response of the resulting device;

(g) infilling the etched regions with doped material consistent with the composition of the second doped layer;

(h) removing the substrate;

(i) etching the semiconductor layers to a suitable width and cleaving the semiconductor layers to a suitable length; and

(j) adjusting the reflectivity of the front and rear facets so as to permit lasing to occur when a biasing signal is applied across the junctions created by the semiconductor layers, whereby the output response of the laser is adapted to quickly respond to a change in the current level of the applied biasing signal.